AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1.   (Currently Amended) A system that facilitates query optimization in a data repository, comprising the following computer-executable components stored in a computer memory:

an optimizing component comprising at least a query component that receives a query to be processed against data of the data repository, which query includes an original predicate, the optimizing component requests a metadata engine an implication rule for a given column, or for a function on a given column by sending the metadata engine an expression to which the column or function on a column is to be compared, and a list of one or more indices that can be exploited for the comparison; and

[[a]] the metadata engine that generates one or more implied predicates based on at least an existing rule for [[a]] the column or the function on a column and the one or more indices that can be exploited; and

a predicate component that processes the original predicate into one or more new predicates that include an implied predicate, the implied predicate is selected from the one or more implied predicates based at least on a determination of the predicate being used in index-seek operation or covered by contents of the one or more indices and processed against the data to return a best solution such that a total evaluation cost is significantly reduced.

2.   (Original) The system of claim 1, the predicate component processes the original predicate to obtain an equivalent predicate.

3.   (Original) The system of claim 1, the predicate component processes the original predicate to obtain a residual predicate.

4.   (Original) The system of claim 1, the query is a previously processed query that is unmatched.

5.   (Original) The system of claim 1, the one or more new predicates can be used for standard indices and multi-valued indices.

6.   (Original) The system of claim 1, the one or more new predicates are considered cost-based alternatives that are utilized only of the evaluation cost is reduced, otherwise, they are discarded.

7.   (Canceled)

8.   (Original) The system of claim 1, the query is processed against a data type that is a non-indexable type.

9.   (Original) A data repository optimizer according to the system of claim 1.

10.   (Currently Amended) A system that facilitates query optimization in a data repository, comprising the following computer-executable components stored in a computer memory:

an optimizing component comprising at least a query component that receives a query to be processed against data of the data repository, which query includes an original predicate, the optimizing component requests a metadata engine an implication rule for a given column, or for a function on a given column by sending the metadata engine an expression to which the column or function on a column is to be compared, and a list of one or more indices that can be exploited for the comparison; and

[[a]] the metadata engine that generates at least one of an implied or equivalent predicates based at least on an existing implication rule for [[a]] the column or the function on a column and the one or more indices that can be exploited; and

a predicate component that processes the original predicate into one or more new predicates that include at least one of an implied predicate, an equivalent predicate, and a residual predicate, either of the implied predicate or the equivalent predicate is selected from the one or more implied predicates based at least on a determination of the predicate being used in index-seek operation or covered by contents of the one or more indices and is processed against the data to return a best solution such that a total evaluation cost is significantly reduced.

11.   (Original) The system of claim 10, the implied predicate and the equivalent predicate are considered cost-based alternatives that are discarded if the evaluation cost is not reduced.

12.   (Canceled)

13.   (Original) A server that employs the system of claim 10.

14.   (Previously Presented) The system of claim 10, the predicate component generates an expression using the one or more new predicates, which expression is used to obtain the implication rule that is associated with at least one of the given column or the function on a given column.

15.   (Canceled)

16.   (Canceled)

17.   (Previously Presented) The system of claim 10, further comprising a classifier that facilitates automating one or more feature thereof by making an inference based on one or more parameters related to at least one of a cost-basis evaluation, cardinality estimation, and complexity of the query.

18.   (Original) The system of claim 10, the total evaluation cost includes employing the one or more new predicates only if optimization is increased.

4

19.   (Previously Presented) The system of claim 10, the query is one for which there is no exact match between the one or more implied predicates and keys associated with the one or more indices.

20.   (Original) The system of claim 10, the implied predicate exactly matches an index key.

21.   (Currently Amended) A computer-readable medium having computer-executable instructions for performing a method for optimizing a search query, the method comprising:

receiving a query for whose original predicate there is no exact match to an index key;

reducing the original predicate into at least one of an implied predicate or an equivalent predicate;

requesting an implication rule for a column or a function of a column by transmitting at least one of an expression to which the column or the function on a column is to be compared and a list of one or more standard indices or one or more multi-valued indices that could be utilized for the comparison;

processing at least one of the implied predicate or the equivalent predicate against data of a data repository to obtain search results based at least on an implication rule for [[a]] the column or function on a column is to be compared and the one or more indices; and

analyzing the search results to output a best solution based at least on a determination that the implied predicate or the equivalent predicate is used in index-seek operation or covered by contents of one or more indices.

22.   (Previously Presented) The method of claim 21, further comprising requesting the implication rule for a column or function on a column.

23.   (Canceled)

24.   (Original) The method of claim 21, further comprising removing the implied predicate if the implied predicate does not exploit one of the standard or multi-value indices.

25.   (Original) The method of claim 21, further comprising employing a new ad-hoc exploratory rule for an individual operator of the original predicate.

26.   (Original) The method of claim 25, further comprising analyzing at least one of the implied predicate and the equivalent predicate with the exploratory rule.

27.   (Original) The method of claim 21, further comprising the acts of:

         requesting a list of tentative substitutes with predicates that involve nested queries;

         including the substitutes into the query to form a new expression;

         simplifying the new expression;

         removing nested queries; and

         generating new alternatives for the search.

28.   (Original) The method of claim 21, further comprising processing the original predicate to generate a residual predicate the refines the search.

29.   (Original) The method of claim 28, further comprising processing the residual predicate after the act of processing at least one of the implied predicate and the equivalent predicate.

30.   (Original) The method of claim 21, further comprising adding the implied predicate to the original predicate and searching for the best solution.

31.   (Original) The method of claim 21, further comprising replacing the original predicate with the equivalent predicate and searching for the best solution.

32.   (Original) The method of claim 21, further comprising performing a cardinality estimation using at least one of the implied predicate and the equivalent predicate.

33.   (Original) The method of claim 21, further comprising creating an index based on an index extension scheme, which scheme includes at least one of,

providing a key column of a data type that corresponds to a data type being indexed;

providing a set of parameters; and

providing a table-valued function name that is used to generate an index entry for a value of the column being indexed.

34.   (Previously Presented) A system that facilitates query optimization in a data repository; comprising following means stored in a computer memory:

means for receiving a query for whose original predicate there is no exact match to an index key;

means for reducing the original predicate into at least one of an implied predicate or an equivalent predicate;

means for requesting an implication rule for a column or function on a column;

means for transmitting at least one of an expression to which a column or function on a column is to be compared and a list of standard indices or multi-valued indices that could be exploited;

means for processing at least one of the implied predicate or the equivalent predicate against data of a data repository to obtain search results;

means that analyzes the search results and outputs a best solution based at least on a determination that the implied predicate or the equivalent predicate is used in index-seek operation or covered by contents of the standard or multi-valued indices.

35.   (Original) The system of claim 34, further comprising means for employing a new ad-hoc exploratory rule for an individual operator of the original predicate.

36.   (Previously Presented) The system of claim 35, further comprising means for analyzing at least one of the implied predicate and the equivalent predicate with the exploratory rule.

37.   (Original) The system of claim 34, further comprising at least one of:

means for requesting a list of tentative substitutes with predicates that involve nested queries;

means for including the substitutes into the query to form a new expression;

means for simplifying the new expression;

means for removing nested queries; and

means for generating new alternatives for the search.

38.   (Original) The system of claim 34, further comprising means for processing the original predicate to generate a residual predicate the refines the search.

39.   (Previously Presented) The system of claim 38, further comprising means for processing the residual predicate after processing at least one of the implied predicate or the equivalent predicate.

40.   (Original) The system of claim 34, further comprising means for estimating cardinality using at least one of the implied predicate and the equivalent predicate, where use of the implied predicate facilitates defining an upper bound on a number of rows that can satisfy the original predicate.

41.   (Previously Presented) The system of claim 34, further comprising means for removing the implied predicate if the implied predicate does not exploit one of the standard or multi-value indices.

42.   (Previously Presented) The system of claim 1, the metadata component employs an indexed computed column that utilizes the column when the column is non-indexable.